PRESS RELEASE

Fraunhofer IZFP at GIFA 2019: Robot-assisted sensor system for the quality monitoring of hybrid parts and components

Within the framework of quality monitoring of lightweight construction components intelligent sensor systems become crucial: In many industries, especially in aerospace engineering and automotive industry, the use of forward-looking hybrid designs based on fiber composites and light metals is steadily rising. Material defects in the final product may result in early malfunction, thus, impairing the safe use of the product. From 25-29 June 2019, at the 14th International Foundry Trade Fair in Düsseldorf, Fraunhofer IZFP scientists will introduce a robot-assisted sensor system for the nondestructive inspection of hybrid cast components, which can easily be integrated into the quality monitoring of production processes (hall 13, booth A34).

Time-consuming destructive inspection methods used in quality assurance result in enormous costs, as the product is damaged or even destroyed during the process. Moreover, as a consequence of destructive inspections being randomized, process disturbances are often not detected until a considerable amount of scrap has already been produced. Thus, nondestructive methods offer an alternative and, after adequate realization, even a long-term substitute for destructive methods. The Fraunhofer Institute for Nondestructive Testing IZFP in Saarbrücken inspects components or parts already during the manufacturing process, without damaging the material itself or changing the surface and properties.

Cognitive sensor systems for inline quality monitoring of production processes
In the context of industry 4.0 the automated operation of intelligent nondestructive sensor systems is crucial for the safeguarding of maximum product quality during production processes: At this year's GIFA our experts present a robot-based sensor system for quality monitoring, which can easily be integrated into production processes. A possible application of such systems will be demonstrated by the robot-assisted inspection of hybrid cast samples. These

Head of Corporate Communications / Editorial Notes:
Sabine Poitevin-Burbes | Fraunhofer Institute for Nondestructive Testing IZFP | Phone +49 681 9302-3869 | Campus E3 1 |
66123 Saarbrücken, Germany | www.izfp.fraunhofer.de | sabine.poitevin-burbes@izfp.fraunhofer.de

Further Contact:
Frank Leinenbach | Fraunhofer Institute for Nondestructive Testing IZFP | Phone +49 681 9302-3627 | Campus E3 1 |
66123 Saarbrücken, Germany | www.izfp.fraunhofer.de | frank.leinenbach@izfp.fraunhofer.de

are die-cast aluminum ingots reinforced by a metal insert on the inside. The integrated eddy current inspection method allows the validation of quality characteristics such as position or integrity of the insert.

Robot-assisted sensor system for the nondestructive inspection of hybrid cast components, which can easily be integrated into the quality monitoring of production processes.
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The benefits of robot-based inspection with eddy current compared to conventional computed tomography relate to the uncomplicated inspection with significantly less necessary safety precautions as well as to the assessment of relevant quality features: This preserves resources, reduces costs and helps to strengthen the competitive position of producers. This Saarland research institute is endued with decades of experience and know-how in the field of combination and automatization of nondestructive inspection methods for production lines.

Cognitive sensor systems – efficient processes
Fraunhofer IZFP is an internationally networked research and development institute in the field of applied, industrial-grade research. Its activities are focused on the development of "cognitive sensor systems" for the nondestructive monitoring of industrial processes and value chains. Major concepts of these technologies are derived from AI research.

In addition to pure production processes, the activities cover equally processes from materials and product development, maintenance, repair, and recycling of materials.